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ABSTRACT

The purpose of this study was to determine the discriminatory ability of eight selected skill tests in evaluating the abilities of a group of male basketball players. The raw scores of the skill tests for each participant were analyzed by a stepwise discriminant analysis procedure. The results of this study indicate that a test battery comprised of the speed pass, dribble, push pass, front shot, jump and reach, and the zig-zag dribble will provide an objective measure of basketball skill and effectively discriminate between successful and unsuccessful participants. (JD)

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A Stepwise Discriminant Analysis of 8 Selected Basketball Skill Tests

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The testing of sports skills has become an important par' of the evaluation process in programs of physical education. Results of skill testing have typically been used for classification, diagnosis, motivational purposes, and primarily grading. In addition, coaches have experimented with using the results of skill tests as an aid in identifying potential team members from a large group of initial candidates. Cousins (1975) stated "skill tests are in reality predictive measures, since they attempt to discriminate among levels of playing ability" (p.8). A problem that continues to confront the physical education and coaching professions has been that of evaluating sport skill test results and their relationship to successful performance. This study attempted to look at this relationship in the skill domain of basketball.

Attempts in the last 70 years to develop objective skill tests to measure basketball playing ability have resulted in a number of recommended test items (Barrow, 1959; Brace 1904; Geltz, 1939; Lehsten 1948; Schwartz, 1937; Young and Moser, 1934). While some suggest three test items, others suggest nine items to measure the same ability. The culminating attempt to identify a battery of basketball test items was done by the Research Council of the American Alliance for Health, Physical Education, and Recreation (AAHPER) (AAHPER, 1966). This resulted in a nine item test battery whose primary purpose was to help students evaluate their performances in the fundamental skills and to provide an incentive for improvement. While the tests were primarily intended for instructional aide, it was also stated that a coach could use the results in early training as "an aid to discovering the better players, finding those with special talents in certain skills and diagnosing faults which need correction." (AAHPER, 1966, p.15). This infers that a battery of basketball skill tests could be used to discriminate among levels of playing ability. How effectively can this be done and what combination of test items would provide the most efficient discrimination?

Based on a previous factor analysis study of 21 basketball skill tests (Hopkins, 1976), four hypothesized dimensions of basketball playing ability were identified. These dimensions were given the following names: 1) shooting: 2) passing: 3) jumping: and 4) dribbling. It was concluded that a basketball skill test battery comprised of the test items with the highest factor loadings on each dimension would provide an objective measure of basketball playing ability. However, the question remains, how effective would such a battery be in discriminating among differing abilities of a large group of basketball players?

How could a skill test battery aid a coach in identifying potential team members from a large group of initial candidates?

The purpose of this study was to determine the discriminatory ability of 8 selected skill tests in evaluation the abilities of a large group of male basketball players. The tests selected were the two from each dimension that had the highest factor loadings or best represented that dimension in the Hopkins' (1976) study (Table 1.)

The 8 items were administered to 93 boys ranging in age from 13 to 17 attending the 1978 University of Minnesota - Duluth Summer basketball Camp. At the end of the one-week camp session, based on the ratings of 3 college and 3 high school coaches, participants were designated as either successful or unsuccessful performers. Successful performers were considered to be capable of making a typical school team. Unsuccessful performers were considered to lack this ability. Each participant was rated independently by the coaches. Their evaluations were based on ovservations during drills and competition. In order to be designated a successful performer, a participant must have received at least 4 of the 6 coaches votes. 55 of the 93 boys were disignated successful performers and 38 were designated unsuccessful. This high percentage of successful performers was logical in that the summer camp program typically attracted those that were very interested in the game and had experienced some success.

The raw scores of the 8 skill tests for each participant were analyzed by a stepwise discriminant analysis procedure. This procedure attempted to identify a reduced set of test items which tended to contribute most heavily to discriminating between successful and unsuccessful selections without losing discriminating power.

The stepwise procedure identified 6 items that significantly contributed to the discriminant function (Table 2). These items were the speed pass, dribble, push pass, front shot, jump and reach, and the zig-zag dribble. The standardized discriminant function coefficiants indicate the effectiveness of each test item in discriminating between group membership. The higher the magnitude, the more effective. An examination of Table 2 indicates that the speed pass (.92) was the most important item followed by the dribble (.74), push pass (.70), front shot (.51), jump and reach (.48), and the zig-zag dribble (.43).

In using the 6 items in classification equations (Table 3), 42 of the 55 (76.4%) successful performers were correctly reclassified and 28 of the 38 (76.3%) unsuccessful performers were correctly reclassified. Overall, approximately 76% of the participants were properly reclassified using the results of the 6 item test battery.

From the results of this study it would appear that a test battery comprised of the speed pass, dribble, push pass, front shot, jump and reach, and the zig-zag dribble would provide an objective measure of basketball skill and effectively discriminate between successful and unsuccessful participants

defined in this study. However, it must be remembered that 100% matching of the coaches' fatings and the skill test results wa- not attained. Although skill is extremely important, other variables are often considered by the coach.

While the results of this test battery would not be sufficient for total evaluation, it may provide a quick, objective, efficient and preliminary assessment of a large group of highly skilled players. The battery might be used to narrow a large group of candidates to a more workable group at which time the coach could use more subjective measurements for evaluation.

References

American Association for Health, Physical Education and Recreation. Basketball for boys: Skills test manual. Washington, D.C.: AAHPER Publication, 1966.

Barrow, H.M. Basketball skill test. The Physical Educator, 1959, 16, 26-27.

Brace, D.K. Testing basketball techniques. American Physical Education Review, 1904,29, 159-165.

Cousins, G. Measurement and Evaluation -use-misuse-abuse. Proceedings of the C.I.C. Symposium on Measurement and Evaluation in Physical Education, 1975.

Geltz, H. Student project in basketball--a basketball proficiency test. Journal of Health, Physical Education and Recreation, 1939, 10,587.

Hopkins, D.R. A Factor analysis of selected basketball skill tests. Unpublished doctoral dissertion, Indiana University, 1972.

Lehsten, N. A measure of basketball skills. The Physical Educator, 1948, 5, 103-109.

Schwartz, H. Achievement tests in girls basketball at the senior high level. Research Quarterly, 1937, 8, 143-156.

Stein, J.U. Better basketball through skill classification. Journal of Health, Physical Education and Recreation, 1957, 28, 10-11.

Young, G.& Moser, H. A short battery of tests to measure playing ability in women's basketball. Research Quarterly, 1934, 5, 3-23.

Table 1

Eight Basketball Skill Test Selected From
A Previous Factor Analysis Study

Dimensions	Test Items
1. Shooting	a. Front Shot (AAHPER) b. Foul Shot (AAHPER)
2. Passing	a. Speed Pass (AAHPER) b. Push Pass (AAHPER)
3. Jumping	a. Jump & Reach (AAHPER) b. Free Jump
4. Dribbling	a. Zig-zag Dribble (Lehsten) b. Dribble (AAHPER)

Table 2

Standardized Discriminant Function Coefficients for the Eight Selected Basketball Tests

	Test Items	Coefficients
1.	Front Shot	.51
2.	Foul Shot	
3.	Speed Pass	.92
4.	Push Pass	.70
5.	Jump and Reach	.48
6.	Free Jump	
7.	Zig-Zag Dribble	.43
8.	Dribble	.74

Table 3

Prediction of Group Membership Using the Six Skill Tests Identified by the Stepwise Analysis

Actual Group	No. of Cases	Predicted Group Membership	
		Successful	Unsuccessful
Successful	55	42 [76.4%]	13
Unsuccessful	38	9	29 [76.3%]

Overall percentage of participants correctly classified 76%